and/or stricturing disease. However, larger prospective studies in both children and adults have not yet been performed and compared to CRP or other markers.

Clinical factors described at diagnosis are more helpful than serologies at predicting the natural history of CD. The initial requirements for glucocorticoid use, an age at diagnosis below 40 years and the presence of perianal disease at diagnosis, have been shown to be independently associated with subsequent disabling CD after 5 years. Except in special circumstances (such as before consideration of an ileoanal pouch anastomosis [IPAA] in a patient with indeterminate colitis), serologic markers have only minimal clinical utility.

DIFFERENTIAL DIAGNOSIS OF UC AND CD

UC and CD have similar features to many other diseases. In the absence of a key diagnostic test, a combination of features is used **(Table 351-5)**. Once a diagnosis of IBD is made, distinguishing between UC and CD is impossible initially in up to 15% of cases. These are termed *indeterminate colitis.* Fortunately, in most cases, the true nature of the underlying colitis becomes evident later in the course of the patient's disease. Approximately 5% (range 1–20%) of colon resection specimens are difficult to classify as either UC or CD because they exhibit overlapping histologic features.

INFECTIOUS DISEASES

Infections of the small intestines and colon can mimic CD or UC. They may be bacterial, fungal, viral, or protozoal in origin **(Table 351-6)**. *Campylobacter* colitis can mimic the endoscopic appearance of severe UC and can cause a relapse of established UC. *Salmonella* can cause watery or bloody diarrhea, nausea, and vomiting. Shigellosis causes watery diarrhea, abdominal pain, and fever followed by rectal tenesmus and by the passage of blood and mucus per rectum. All three are usually self-limited, but 1% of patients infected with *Salmonella* become asymptomatic carriers. *Yersinia enterocolitica* infection occurs mainly in the terminal ileum and causes mucosal ulceration, neutrophil invasion, and thickening of the ileal wall. Other bacterial infections that may mimic IBD include *C. difficile,* which presents with watery

TABLE 351-6 DISEASES THAT MIMIC IBD

Infectious Etiologies		
Bacterial	**Mycobacterial**	**Viral**
Salmonella	Tuberculosis	Cytomegalovirus
Shigella	*Mycobacterium avium*	Herpes simplex
Toxigenic		HIV
Escherichia coli	**Parasitic**	**Fungal**
Campylobacter	Amebiasis	Histoplasmosis
Yersinia	*Isospora*	*Candida*
Clostridium difficile	*Trichuris trichiura*	*Aspergillus*
Gonorrhea	Hookworm	
Chlamydia trachomatis	*Strongyloides*	

Noninfectious Etiologies		
Inflammatory	**Neoplastic**	**Drugs and Chemicals**
Appendicitis	Lymphoma	NSAIDs
Diverticulitis	Metastatic	Phosphosoda
Diversion colitis	Carcinoma	Cathartic colon
Collagenous/lymphocytic colitis	Carcinoma of the ileum	Gold
Ischemic colitis	Carcinoid	Oral contraceptives
Radiation colitis/enteritis	Familial polyposis	Cocaine
Solitary rectal ulcer syndrome		Ipilimumab
Eosinophilic gastroenteritis		Mycophenolate mofetil
Neutropenic colitis		
Behçet's syndrome		
Graft-versus-host disease		

Abbreviation: IBD, inflammatory bowel disease; NSAIDs, nonsteroidal anti-inflammatory drugs.

diarrhea, tenesmus, nausea, and vomiting; and *E. coli,* three categories of which can cause colitis. These are enterohemorrhagic, enteroinvasive, and enteroadherent *E. coli,* all of which can cause bloody diarrhea and abdominal tenderness. Diagnosis of bacterial colitis is made by sending stool specimens for bacterial culture and *C. difficile* toxin analysis. Gonorrhea, *Chlamydia*, and syphilis can also cause proctitis.

GI involvement with mycobacterial infection occurs primarily in the immunosuppressed patient but may occur in patients with normal immunity. Distal ileal and cecal involvement predominates, and patients present with symptoms of small-bowel obstruction and a tender abdominal mass. The diagnosis is made most directly by colonoscopy with biopsy and culture. *Mycobacterium avium-intracellulare* complex infection occurs in advanced stages of HIV infection and in other immunocompromised states; it usually manifests as a systemic infection with diarrhea, abdominal pain, weight loss, fever, and malabsorption. Diagnosis is established by acid-fast smear and culture of mucosal biopsies.

Although most of the patients with viral colitis are immunosuppressed, cytomegalovirus (CMV) and herpes simplex proctitis may occur in immunocompetent individuals. CMV occurs most commonly in the esophagus, colon, and rectum but may also involve the small intestine. Symptoms include abdominal pain, bloody diarrhea, fever, and weight loss. With severe disease, necrosis and perforation can occur. Diagnosis is made by identification of characteristic intranuclear inclusions in mucosal cells on biopsy. Herpes simplex infection of the GI tract is limited to the oropharynx, anorectum, and perianal areas. Symptoms include anorectal pain, tenesmus, constipation, inguinal adenopathy, difficulty with urinary voiding, and sacral paresthesias. Diagnosis is made by rectal biopsy with identification of characteristic cellular inclusions and viral culture. HIV itself can cause diarrhea, nausea, vomiting, and anorexia. Small intestinal biopsies show partial villous atrophy; small bowel bacterial overgrowth and fat malabsorption may also be noted.

TABLE 351-5 DIFFERENT CLINICAL, ENDOSCOPIC, AND RADIOGRAPHIC FEATURES

	Ulcerative Colitis	Crohn's Disease
Clinical		
Gross blood in stool	Yes	Occasionally
Mucus	Yes	Occasionally
Systemic symptoms	Occasionally	Frequently
Pain	Occasionally	Frequently
Abdominal mass	Rarely	Yes
Significant perineal disease	No	Frequently
Fistulas	No	Yes
Small intestinal obstruction	No	Frequently
Colonic obstruction	Rarely	Frequently
Response to antibiotics	No	Yes
Recurrence after surgery	No	Yes
Endoscopic		
Rectal sparing	Rarely	Frequently
Continuous disease	Yes	Occasionally
"Cobblestoning"	No	Yes
Granuloma on biopsy	No	Occasionally
Radiographic		
Small bowel significantly abnormal	No	Yes
Abnormal terminal ileum	No	Yes
Segmental colitis	No	Yes
Asymmetric colitis	No	Yes
Stricture	Occasionally	Frequently